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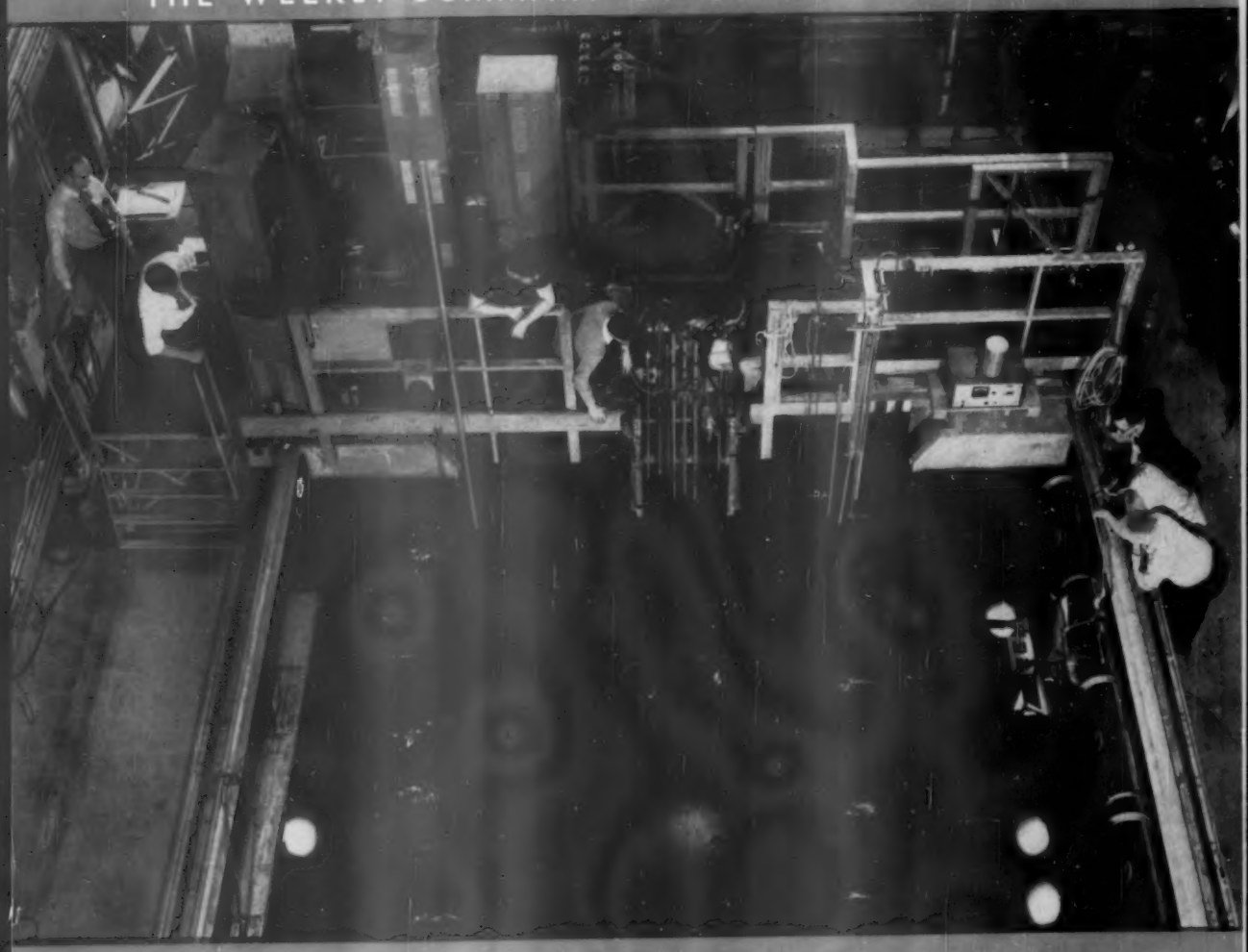
April 16, 1955

VOL. 67, NO. 16 PAGES 241-256

SCIENCE NEWS LETTER

®

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Pool Reactor

See Page 248

A SCIENCE SERVICE PUBLICATION

MEDICINE

Steps to Polio Conquest

Earlier polio vaccines have been tried, but they failed, probably because not enough was known about the viruses that cause the disease.

► POLIO VACCINES have been made and hopefully tried in past years, only to fail. The road to conquest of poliomyelitis, or infantile paralysis, has been long and full of pitfalls.

Before Dr. Jonas E. Salk of the University of Pittsburgh was able to start the research toward his vaccine, many scientists had to dig for facts about the disease and its virus cause.

One of the early vaccines was made, as the present Salk one is, by killing the polio virus with formaldehyde to make it incapable of causing disease. First tests of that vaccine seemed highly promising. Some scientists think it might have succeeded if enough had been known about polio in those early vaccine-making days.

A second early vaccine was made from live virus, treated to weaken it. The scientist who made this one thought the virus had been weakened enough so that it could safely be given. Unfortunately, this proved not to be the case. Numerous cases of polio and numerous polio deaths occurred among children given that vaccine.

The disastrous results put a stop to all polio vaccine-making for a time. Conservative medical scientists grew even more conservative about the very idea of a polio vaccine and only as more knowledge of the disease and more research funds became available did they begin again to try for a vaccine.

Now, with greater knowledge, one has dared again to make a live virus vaccine though no large scale trials have yet been risked.

In the interval between vaccine attempts, chemical prophylaxis was tried. In this period, scientists almost all believed that the polio virus entered the body through the nose, and then traveled along the nerves of smell to the brain and spinal cord to kill nerve cells and thus paralyze. So some scientists tried a chemical blockade of the smell nerves.

This attempt to prevent polio failed, as did numerous attempts at treatment with various drugs to kill the virus after it got into the body.

Discovery of polio virus in intestinal wastes from patients and also, in a few places, in water supplies, led to the idea that epidemics might spread through drinking water, like typhoid fever. Flies and other insects were also, at this period, incriminated as carriers of the polio virus. Anti-fly campaigns and drives for purer water started. These undoubtedly were useful for improving hygiene and sanitation, but they did not stop polio.

Breaks that led to Dr. Salk being able to make his vaccine were:

1. Discovery that there are three strains of polio virus and that being attacked by one does not protect against the others. The Salk vaccine, therefore, is made from the three virus strains.

2. Discovery that the polio virus circulates in the blood stream for brief periods before the onset of illness. This explained how there could be polio antibodies in human blood and dispelled the old, handicapping idea that only substances that got directly into nerves could fight the polio virus.

3. The Nobel Prize-winning discovery of a way to grow polio virus outside the body in non-nervous tissue. This gave a way to get enough virus to make the vaccine for the large scale trials last summer and, if it works, for vaccination of countless children in the future.

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MEDICINE

Finds Kerosene Popular Children's Drink Today

► KEROSENE IS "one of the more popular drinks among children these days," Dr. Julian P. Price of Florence, S. C., declared at the meeting of the American Academy of General Practice in Los Angeles.

As a result, he said, every doctor knows how to treat child victims of kerosene poisoning. When a child eats rat poison, however, the doctor has the problem of determining what poison was in the rat killer, finding an antidote and then watching for complications.

Dr. Price urged the family doctors at the meeting to be prepared to treat this and other kinds of accidental poisonings. Accidents or accidental poisonings are the cause of one out of every three deaths in children over one year of age, he said. Each year 2,000,000 children are involved in an accident requiring medical attention. About 12,000 die and another 40,000 or 50,000 are permanently crippled or disabled.

Doctors should become safety minded in prescribing drugs. Dr. Price urged that specific directions be given the family and the druggist and that the mother should be told what the drug is for and how and when to give it.

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MEDICINE

Polio Is Ancient Disease

► POLIO IS no new disease. It took its first victims thousands of years ago. No matter how it is called, poliomyelitis, infantile paralysis, or polio for short, it is a scourge that has long been a crippler and killer.

To many Americans, polio history starts with the "strange epidemic" that hit the headlines in early summer of 1916.

But this sickness was crippling people, and killing some, thousands of years ago. Ancient Egyptian murals show pictures of persons with the familiar crippling that we see today in polio victims. A skeleton discovered in Egypt which archaeologists date at the period of 3700 B.C. shows bone formation of a kind that looks as if polio had crippled the limbs.

Whether polio struck in epidemics that long ago is not known.

The first record of a polio epidemic was in England in 1835. The first epidemic in the United States was in Louisiana in 1841. The number of cases, four in England and 10 in Louisiana, seem small by present standards.

Even now the total number of cases in an epidemic year is small by comparison with many other diseases. In 1952, the last big epidemic year, for example, polio cases totalled 57,879 while measles struck 683,077 and streptococcus infections hit 113,677 persons.

But the paralyzing, crippling deformities which the ancient Egyptians showed in their wall paintings and the fact that small children are so often the victims has made polio one of the most feared diseases of modern times.

Adding to this fear, until recent years, has been the helplessness of medical men to do much for polio victims, much less to stop epidemics or prevent the disease. Not even the sulfas or the antibiotics, so-called mold remedies, which have proved life-saving in so many serious diseases, have been able to rescue a single person from the onslaught of the polio virus.

In fact, it is less than 50 years since scientists first discovered that poliomyelitis is caused by a microorganism so small that it will slip through the tiny pores of a porcelain filter and which, therefore, belongs to the virus family of disease germs. It is only in the past decade that they discovered that there are three, but no more than three, polio virus strains, and that many polio-like summer ailments are not mild, non-paralytic cases of polio but are due to other viruses.

But in the past 50 years, and particularly in the past 25, scientists have learned many things that could be done to help polio victims survive and live useful lives in spite of paralyzed legs or arms.

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RADIO ASTRONOMY

Jupiter Emits Static

Radio noise has been picked up for the first time from another planet. It is believed to be caused by large scale disturbances in Jupiter's atmosphere.

➤ RADIO WAVES from Jupiter have been detected by Carnegie Institution of Washington scientists.

The radio noise is the first discovered from another planet in the solar system. Although the waves come from Jupiter itself, they are probably caused by large-scale disturbances in the planet's atmosphere resembling earth's thunderstorms. Since the noise bursts have an entirely random pattern, they are not sent by intelligent beings, Drs. Bernard F. Burke and Kenneth L. Franklin told the American Astronomical Society meeting in Princeton, N. J.

Radio waves emitted by the sun and the moon have been known for years. Scientists listening to radio noise from the celestial sphere have detected two kinds, the smooth steady hiss from the moon and radio "stars," and the rapidly varying sounds such as caused by violent processes on the sun.

Drs. Burke and Franklin said the noise heard from Jupiter sounded like "thunderstorm interference on a broadcast receiver."

The radio waves are heard at 22 megacycles, or 22,000,000 vibrations per second. Commercial AM stations broadcast at frequencies of 550 to 1500 kilocycles, thousands rather than millions of vibrations per second.

Jupiter's noise is detected only about one day out of three during the six minutes the giant planet crosses the narrow path of their radio telescope in Seneca, Md., the two scientists said. The antenna picking up Jupiter's sounds makes a giant "X," with each cross 2,047 feet long, in a 96-acre field near there. (See SNL, July 24, 1954, p. 52.)

The planet's motion through the sky caused corresponding changes in the position of the radio source over a period of several months, Drs. Burke and Franklin found.

Jupiter is the largest of all the solar planets, having an equatorial diameter of 88,700 miles, compared to the earth's diameter of 7,927 miles. The giant planet rotates on its own axis once every nine hours and 50 minutes.

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RADIO ASTRONOMY

"Short Waves" From Stars

➤ HEAVENLY SOURCES broadcast radio waves only an inch long, two scientists from the Naval Research Laboratory, Washington, have discovered. Shortest radio waves from commercial AM stations are measured in hundreds of feet.

Seven radio "stars" sending these one-inch radio signals (9,500 megacycles per second) have so far been discovered with the laboratory's 50-foot, saucer-shaped antenna, Drs. F. T. Haddock and T. F. McCullough reported to the American Astronomical Society meeting in Princeton, N. J.

One of the seven new radio sources at 9,500 megacycles is believed to be the center of the Milky Way galaxy in which the sun is but one of billions of stars. The galaxy's center is in the constellation of Sagittarius, now visible low in the southeastern sky in the early morning.

The inch-long radiation from three others of the radio "stars," also visible with binoculars, is due to heat. Although the sun and moon have for years been known to radiate at 9,500 megacycles, the Naval Research Laboratory scientists were the first to detect the one-inch wavelength from objects outside the solar system, and to pin down the reason for such radiation as being thermal.

They could do so because the small angle received by the 50-foot saucer antenna allows them to measure the size of the three sources—one in Orion, the Omega Nebula and NGC 6357.

Comparison of the visible brightness and size to the radio energy and size in each case confirmed the fact that radiation from the three is due to heat.

The mechanism by which most radio "stars" emit their radiation is not known, but it is thought not to be due to heat for bright sources at wavelengths of four inches and longer.

Knowing that one-inch radio waves from some sources are thermal in origin will help astronomers to learn the reasons why other radio "stars" emit radio waves having longer wavelengths.

If human eyes could see radio waves, the brightest stars visible at one-inch wavelengths would be bluer than those seen at four inches. Another entirely different group of stars would appear bright at wavelengths of 39 inches, or one meter.

The seven sources sending one-inch radio waves are also the most intense emitters of radiation in the four-inch range, Drs. Haddock and McCullough said. The seven discovered so far include the source in Sagittarius; the Orion Nebula and the two bright hydrogen emission nebulae, Omega and NGC 6357; and the three brightest sources at 39-inch wavelengths, Cassiopeia-A, Cygnus-A and Taurus-A.

Dr. A. E. Lilley, also of the Naval Research Laboratory, described to the meeting absorption effects in the spectra of radio "stars," particularly Cassiopeia-A, produced by interstellar hydrogen between the observer and source (see SNL Jan. 29, p. 71).

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TECHNOLOGY

Garnet Gem Created By Diamond Makers

➤ PRESSURES FAR down toward the earth's core, now duplicated by the press that has produced genuine diamonds at the General Electric Research Laboratory, have proved to be the secret of another of nature's jewel-making processes.

Garnet, the dark red gem stone which occurs with the green mineral hornblende, has been formed from that hornblende by General Electric scientist, Dr. Robert H. Wentorf Jr., one of the researchers who took part in the diamond-making venture. Dr. Wentorf has also reversed the process and changed garnet back to hornblende.

Water is a necessary ingredient in the hornblende, Dr. Wentorf found, but must be removed by adding a suitable material which will take it away in order to produce the garnet crystals. Temperature of about 2,200 degrees Fahrenheit and pressure greater than 375,000 pounds per square inch are the necessary conditions in General Electric's press, which is so built that high temperatures and high pressures can be achieved and held constant for long periods of time.

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GARNET MAKERS — Dr. Robert Wentorf discusses with Dr. H. Tracy Hall how nature formed Gore Mountain garnet some 60 miles below the earth's surface.

ASTRONOMY

Volcanoes Active on Mars

Dark markings of volcanic ash that drift with prevailing winds give evidence that Martian volcanoes erupt about as frequently as those on earth.

➤ VOLCANOES ON Mars apparently erupt about as frequently as those on earth, Dr. Dean B. McLaughlin of the University of Michigan told the American Astronomical Society meeting in Princeton, N. J.

Dark areas on the Martian surface, he believes, result from deposits of drifting volcanic ash falling out in the pattern of prevailing winds.

These winds, Dr. McLaughlin said, "behave precisely like the well known monsoons of India."

Several prominent changes have occurred on the Martian surface over the last 150 years, Dr. McLaughlin found from a study of observations made of the planet by other astronomers prior to 1930. Four of these could be explained only by volcanic action at a definite location. In three of them, a large dark spot is now visible at this place.

From all four volcanoes, Dr. McLaughlin's historical research showed, dark markings had fanned out in the direction to be expected from monsoon-like winds. These markings were horn-shaped, curving as expected from the planet's rotation, to the right in the Northern Hemisphere, to the left in the Southern Hemisphere.

A few cubic kilometers of ash would be enough to account for these markings, Dr. McLaughlin said. Such ash deposits on Mars are "not any greater than those of large terrestrial eruptions," but rainstorms, streams and rivers, and plants that hide or erase ash here are non-existent there. Thus only the winds drift volcanic ash about, later concealing it with desert dust or a new ash layer.

Since only a thin film of ash is needed to change the surface color, Dr. McLaughlin said, "Martian volcanic activity seems to be similar in magnitude to that on the earth."

The long bands of ash deposited by the monsoon-like winds usually have pointed or funnel-shaped markings as tributaries or at their ends. They are found mostly south of the equator because the strongest winds occur in the southern summer when Mars is closest to the sun.

Of the four volcanoes, one occurred at the spot now called Pambotis Lacus, another in Hydaspis Sinus and two in the region of Solis Lacus, or the "eye" of Mars.

An example of recurring volcanic activity, Dr. McLaughlin believes, is furnished by the great changes of the broad band, or "canal," Thoth-Nepenthes. This is sometimes only a feeble trail but on other occasions is a broad dark band. The volcano spewing this ash must be located in the oasis called Alcyonius Nodus.

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ASTRONOMY

Particles in Red Stars

➤ RAIN AND clouds forming in the earth's atmosphere may behave like the liquid and solid particles formed in cool, red stars, Dr. Paul W. Merrill of Mt. Wilson and Palomar Observatories told the American Astronomical Society meeting in Princeton, N. J.

Current rain-making tests, he suggested, should give astronomers new methods of analyzing problems of the birth, growth and death of stars.

The coolest and largest of known stars are red in color. Most of the smallest stars are also red. Thus the ruddy stars illustrate the two extremes of stellar evolution.

The coolest known red stars have a surface temperature of about 2,500 degrees Fahrenheit. This temperature may mark the points where veiling of the star's light by solid or liquid particles occurs, Dr. Merrill said.

Disturbances causing variations in the amount of stellar light may result in condensation of droplets that later evaporate slowly, somewhat like high-flying jet planes, leaving a long, slowly disappearing train of white particles, or vapor trails.

"Variable veiling," Dr. Merrill concluded, would be a likely way to explain the observed changes in brightness of red stars, some of which at times give light 100 times more intense than at others.

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GENERAL SCIENCE

Don't-Talk Rule Clams Up Defense Department

➤ THERE ARE more clams in Washington than ever before. Some information people in the Department of Defense now shut up tight at the mere tinkle of a telephone or approach of a newspaperman.

Even security for protection of military secrets was never like this. The specialists in the armed forces prior to Secretary of Defense Wilson's "don't talk" directive were able to at least talk to the inquirers without merely repeating: "Your inquiry should be directed to Department of Defense public information." Now it is as much as their job is worth for them to answer civil questions, quite non-secret and unclassified.

Information is now supposed to be obtained through channels. These are getting clogged. Those who know have to receive inquiries relayed through those who admittedly do not know.

Like situations that often arise in Washington, this one will probably straighten out in a few days or weeks. It will be changed because it will not work. Meanwhile, clams are in season.

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SCIENCE NEWS LETTER

VOL. 67 APRIL 16, 1955 NO. 16

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C., NOrth 7-2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., $5.50; 2 yrs., $10.00; 3 yrs., $14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

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Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C., under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Reader's Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 1 E. 54th St., New York 22, ELdorado 5-5666, and 435 N. Michigan Ave., Chicago 11, SUperior 7-6048.

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ANTHROPOLOGY

Lose Fat in Hot Weather

Anthropologists' meeting reveals that fat is lost in summer, ancient Greeks had "holes in their heads," and age cannot be determined from closure of skull bones.

➤ YOU MAY not realize that you lose fat in summer heat, if you trust the reading on the drug store, or your bathroom, scales as a measure of your fatness.

The fact that you do lose fat and why the scales do not show it were explained by Dr. Russell W. Newman, Army HQ Quartermaster Research and Development Command, at the meeting of the American Association of Physical Anthropologists in Philadelphia.

Dr. Newman separated the gross body weight of some 2,000 young American men into two factors. First was the weight of the bones, body fluids and muscles. This is what Dr. Newman calls the fat-free weight or heat-producing mass of the body.

Second factor is the body fat as represented by the rolls of fat some people are able to pick up between their fingers, including the "inner tube" around the waist and the double or triple chins under the jaw line. This is a heat-holding layer that surrounds the fat-free mass.

The heat-holding fat layer goes down as the temperature goes up in summer, Dr. Newman found. The heat-producing fat-free weight has a tendency to go up as the temperature sinks in winter.

Indians Not So Healthy

➤ THE POPULAR idea that the ancient Indian was an extremely healthy and strong person was exploded by a report by Dr. Marcus S. Goldstein of the U. S. Public Health Service of the condition of the bones of early Indians of Texas.

Three out of 10 adult skulls and four out of 10 adult skeletons showed signs of diseased conditions, defects or injuries, including fractures.

Skulls Were Porous

➤ THE ANCIENT Greeks literally had "holes in their heads," it is indicated by a report to the association. But the modern disease syphilis was unknown among them.

Examination of over a thousand Greek skulls showed that before 2,000 B.C. one out of every four Greeks suffered from osteoporosis of the skull bones, a condition in which there are abnormal spaces in the bones. Dr. J. Lawrence Angel of Jefferson Medical College in Philadelphia reported the findings.

The porous bone condition gradually decreased, however, until by Classical times it had completely disappeared. Later it increased again to a peak of 30%.

Like modern American young people, the Greeks gained in body size with succeeding generations into historic times. But there was no following drop in size later.

The agonizing pains of arthritis plagued the ancient Greeks, especially the men. Incidence of the disease among men dropped, however, from 30% to 15%. It remained steady at a lower incidence among women —10% to 12%.

Arthritis of the spine dropped from a high of 61% to 42% among men, but for the women it remained at a lower figure, 40%.

Explanation for this lower figure for women may be found, Dr. Angel said, in the fact that women of that day had a five- to eight-year shorter life span than men. They died before they developed arthritic backs. Reason for this may be in a high childbirth mortality.

The ancient Greeks had no syphilis, their bones showed.

Skull Test Unreliable

➤ EXPERTS ATTEMPTING to identify a body from the condition of the skeleton can no longer rely on the growing together of the bones in the skull to give them the age of the dead person.

In the past, it has been generally accepted that by the age of 35 the bones would be completely grown together. This is an error, Dr. W. Montague Cobb of Howard University School of Medicine, Washington, D. C., told the meeting.

Examination of over 2,000 skulls showed that the closure is complete at 35 in only 21.4% of white men and 36.5% of Negro men. Closure is complete in a slightly higher percentage of women.

Not only is the bone closure not always complete at the age of 35, it is usually not complete at the age of 61. Dr. Cobb found closure complete in only 36.5% of male whites at 61 years, 40% of female whites, 45.9% of Negro males and 49.4% of Negro females.

Privation Makes Dwarfs

➤ SEVERAL GENERATIONS of miserable living conditions can make a people into dwarfs, Rev. Dr. Martin Gusinde, anthropologist of Catholic University, Washington, told the meeting.

That is what Dr. Gusinde found when he went to explore rumors of a race of pygmies living high in the mountains between Venezuela and Colombia. The rumors of South American pygmies have persisted since the first conquerors explored the region in 1520.

The people are small, Dr. Gusinde said, but they are not true racial pygmies. These Indians, named "Yupa," live in very small communities called "rancherias," consisting of from two to 15 individuals. It sometimes happens that the average height of the adult men of a rancheria is four feet eleven inches or less.

But even if it should be found that all the Yupas are as small as that, they could not be considered as true pygmies, Dr. Gusinde concluded. Their small size is a result of the deprivation in their living conditions.

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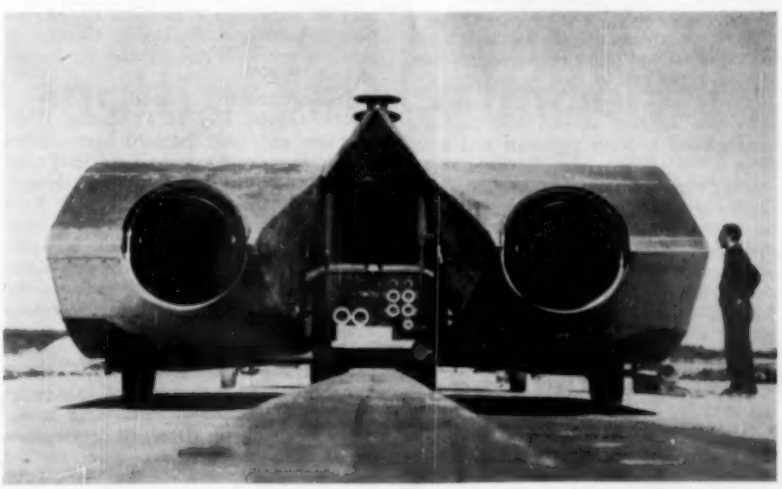

TESTS BRAKES—This jet-powered car is used in the development of aircraft arresting gear. The 10,000-pound combined thrust of two Allison J33-A8 engines drive it at high speeds along a 5,000-foot track. The tests are conducted by the All American Engineering Co., Wilmington, Del.

CHEMISTRY

Chemists Changing World

Meeting of American Chemical Society notes how advances in the science has brought vast new industries into existence in a comparatively few years.

➤ CHEMISTS ARE creating more major changes for the world, sessions of the American Chemical Society in Cincinnati revealed.

Within the lifetimes of those still in school, chemical science has brought atomic energy, antibiotics, new plastics, more riches from petroleum, and a thousand other things.

Advances were reported at this meeting in the following fields:

Chemicals which feed cancerous cells, and chemicals which damage them, thereby helping the patient. Irritating chemicals which start cancers, and the body's response.

How bones grow, and how much of the living bone is rock-like crystal. What role phosphorus plays in the chemical processes of life.

Relief for patients with high blood pressure, and methods for testing new drugs which will show the doctor the difference between effect of the drug and reaction of the patient.

Chemical pattern of drugs found helpful in treatment of disease symptoms, in both man and animals.

What can be learned about the cellulose molecule by taking it apart a little at a time. Application of this knowledge to improvement of wood, paper and photographic film made from cellulose esters.

How chemicals can change the make-up of soil, either to make farming better or to make firmer roadbeds and safer airstrips.

Aromatic chemicals, of the type made from coal tar and heavy petroleum residues, and how they can be used in industry.

Molybdenum, a metal coming more and more into use both alloyed with steel and compounded to form pigments and lubricants.

Many elements long known are proving capable of forming new kinds of useful compounds, making them exciting substances to chemists. Silicon, boron, titanium, zirconium and the so-called rare earths are among these. A symposium was held to describe these and especially their compounds with hydrogen.

Better Gas With Urea

➤ IMPROVED GASOLINE, jet fuels, fuels for diesel engines and lubricating oils may be taken out of crude petroleum by a process almost as simple as filtration. Extensions of this new process, which uses the chemical urea to trap "straight chain" molecules, were reported to the society.

Urea, when added to a mixture of liquid hydrocarbons, such as ordinary petroleum, forms crystals in which gasoline fractions of simple chemical structure are trapped. These can be filtered from the crude oil, leaving the so-called "branched" hydrocarbons, which are desired in gasoline for their anti-knock properties.

New information on how the urea "host" crystals trap their hydrocarbon "guest" molecules in this process was given by Dr. Hermann Schlenk of the Hormel Institute of the University of Minnesota. Using the same process to separate fatty acids, Dr. Schlenk found forces of attractions in the crystals which line up the fatty acids in pairs with the acid and non-acid parts of the molecules alternating in direction.

Heating the urea crystals allows the guest molecules to escape as oily drops.

Cyclic processes to separate petroleum fractions and recover the urea and the solvent alcohol used with it were reported by Dr. L. C. Fetterly of the Shell Development Co., Emeryville, Calif. Instead of the alcohol, water with suitable additives may be used in the continuous process, Dr. Fetterly said.

Study Artery Hardening

➤ THAT A person is as old as his arteries has new meaning in the present day of replaceable spare parts for the human body. Leaks where artery splices have been made may be started by strains due to the continuous pulsing of the blood. Changes in aging artery walls can increase the hazard of such leaks.

At the University of Southern California in Los Angeles, Drs. H. H. Zinsser, Leslie Kaeburn and John Leonard have studied three tissues in artery walls to find what changes take place in them as the body ages.

Smooth muscle, collagen and elastic fibers make up the walls. They change in structure independently, the Los Angeles scientists find, with muscle and collagen showing their age the least. They reported the results of their studies with electron microscope and X-ray diffraction apparatus to the meeting.

Progressive crystallization in the walls of the arteries, of a type not previously recognized, may make the walls more brittle, the California team stated, while the relaxing chemical, hyaluronidase, when injected into the tissues seems to loosen the gel-like material in which the muscle fibers are embedded without harming the fibers themselves. The elastic fibers are believed to draw on the gel-like material to form the crystals which increase with age, pointing the way toward further study of the relationship between these structures.

Tar From Plants

➤ DUPLICATING NATURE'S secret process for making bituminous material from decaying plant remains was the aim of researches whose results were reported at the meeting.

Action of alkaline solutions on cellulose, the plant's structural material, and on carbohydrate compounds known to be formed when cellulose breaks down, yielded oily products similar to bitumen, in researches carried on at the Johns Hopkins University by Dr. Walter G. Berl of the Applied Physics Laboratory of that university and Dr. Charles E. Feazel of the Southern Research Institute, Birmingham, Ala.

As an intermediate product, a "humic acid" was formed after the treatment had been carried on for only a short time. Further action of the alkaline solution changed this material to the bituminous oil.

Acid products of cellulose decomposition gave very little of the oil when treated in the same way. Acetol is believed to be the intermediate product between cellulose and humic acid.

Rays Toughen Plastics

➤ WARNING THAT chemical effects produced in plastic film by exposure to the reactions going on in a nuclear reactor are not the same as those produced by radiations from a fission product source, such as cobalt 60, was given by Drs. Milton Burton and M. P. Reddy of Notre Dame University.

Cross-linking increases strength and toughness in plastic film which has been irradiated.

The question in exploring effects of irradiation on plastics, these scientists stated, is not "why does cross-linking of polymers occur" but rather "why does it not always occur."

Partial breakdown of fluorine-containing polymers, resulting in corrosive materials which take part in the cross-linking reaction, was reported by Drs. Allan R. Shultz and Frank A. Bovey of the Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Anti-Arthritis Drug

➤ A NATURAL sweetener that missed saccharin's role as a non-nutritional flavoring substance may prove to be the source of a new anti-arthritis drug.

Known as stevioside, its complex chemical formula containing three units of ordinary sugar plus other structures was described by Dr. Hewitt G. Fletcher of the National Institutes of Health.

The non-sugar component of stevioside is partly responsible for the extreme sweetness, as great as saccharin, or 300 times as great as sugar. Found in leaves and twigs of the "sweet herb of Paraguay," the sweeten-

ing agent amounts to seven percent of the wild plant. It was once cultivated in South America in the hope of finding a market, but although it is plentiful the cost of harvesting keeps it from competing with saccharin and other synthetic sweeteners.

Now the cyclic component attached to the sugar-like stevioside offers hope that the plant may become a raw material for cortisone-like compounds. Chemically, stevioside is interesting as the only sweetening substance of any power that contains no nitrogen. No chemical structure common to sweetening materials has been discovered.

Inks Need Stickiness

➤ WHAT makes things stick together, especially things like paint, plastics and printing ink?

Printing ink especially should stick to the surface it is printed on. Its ability to do so is affected by conditions for its solid rupture vs. those for its viscous flow, stated Dr. A. C. Zettlemoyer and his associates of the National Printing Ink Research Institue at Lehigh University, Bethlehem, Pa.

High speed photography helped these scientists learn about these conditions and how they are affected by added pigments and other factors.

Adhesives for bonding two pieces of glass together are best made of polyvinyl-butyral resin mixed with modified phenol, Dr. Frank Moser of the Pittsburgh Plate Glass Company told the meeting. Other new types of adhesives for glass were listed by him, including epoxy resins.

Dr. E. W. McGuiness of the General Electric Company praised epoxy resins for stability at the boiling point of water, naming many catalysts which improve these new resins.

Science News Letter, April 16, 1955

TECHNOLOGY

Milk Vending Machines Possible With New Pump

➤ VENDING MACHINES dispensing milk into paper cups like soda pop may soon be popping up in theater lobbies and office corridors.

A splash-proof pump has been developed at the Armour Research Foundation of the Illinois Institute of Technology, Chicago, that meets with "strict health requirements that milk dispensed from a machine must not splash or touch moving parts."

The new pump is described as the first device ever perfected to meter and pump a liquid continuously without splashing and without the use of a pressurized tank. In operation, the milk remains inside rubber tubing connected to a milk tank. The milk is trapped in the tubing between two rollers.

In ordinary pumps, the Armour scientists said, splashing is prevented by reducing the pulsation, much like the action of the shock absorber on a car. In the new pump, an especially-designed cam that lifts each roller completely eliminates the pulsation.

Science News Letter, April 16, 1955

GENERAL SCIENCE

Study Lighthouse Horizon

➤ AFTER WATCHING over the Sandy Hook, N. J., horizon for 93 years, the historic Navesink Lighthouse has been retired. But not until scientists had spent nine months in its tower taking nearly 3,000 pictures of that horizon.

Lenses were focused on that thin, sometimes imperceptible line between sea and sky to perfect techniques of shooting the boundary as an air-navigation aid.

If photographed accurately enough, the horizon could provide a reference line to determine pitch and roll of aircraft. The accuracy called for in the experiments allowed an error in angle of roll not greater than 1/240th of a degree.

The scientists, from the research division of the New York University College of Engineering, are now studying the slides to find the best combination of film, filter and exposure to record the horizon from an airplane. The results will be turned over to the Sperry Gyroscope Co., which sponsored the research.

Flight tests are scheduled to try out the system which is expected to help check aircraft stability.

The NYU researchers report that water vapor in the air was the greatest single obstacle to clear horizon shots. To increase contrast, they experimented with sky-colored filters.

Smoke from industrial areas of New York, New Jersey and Philadelphia hampered the photographic work considerably, they said. But it also provided a screen that might well be encountered by aircraft in flight.

The group began taking pictures with a standard 35mm camera and later used a 400mm long range lens.

SHOOTING HORIZON—NYU researchers prepare to take picture from Navesink Lighthouse tower. Darrell Hill, left, takes light reading while Fred Bengston sets camera mount.

As the scientists moved their gear away, caretaker William Kennebeck took charge of the house, made obsolete by radar and sea-based lights. But unlike most Government-owned lighthouses which have been scrapped or made over into motels or restaurants, this lighthouse will become a historical monument and marine museum with a surrounding park.

Science News Letter, April 16, 1955

MEDICINE

Length of Smoke Important

➤ HOW SHORT you smoke your cigarette is found to be important by the chemical laboratory of the American Medical Association.

The latest of a series of reports on cigarettes, cigarette smoke and filters appears in the *Journal of the American Medical Association* (April 9). It is summarized by the American Medical Association as follows:

"If you are concerned about how much nicotine and tar gets to your mouth when you smoke, you almost have to have a chart in your hand. If you want the least amount, you would do well to smoke a king-size laminated asbestos-paper filter cigarette, but only if you put it out while the butt is about an inch and a half long. If you smoke it any shorter, you get more nicotine and tar than from a regular size.

"Other filtered king-size cigarettes let a little more nicotine and tar through. A regular length no-filter brand screens out still less, but you can smoke it down to about an inch and get less nicotine and tar than if you smoke a king-size right down to the filter. You would be better off if you smoked even a non-filter king-size and threw it away when it got to the inch-and-a-half stage. This means, the laboratory said, that you cannot get more protection and a longer smoke at the same time, in spite of what the advertisements say.

"It does not seem to make much difference whether you smoke a regular cigarette or some filter tip kind, since tobacco itself is as good a filter as some of the tips. But a length of filter made from cellulose acetate fiber, asbestos-paper, or activated charcoal with paper is a more efficient screener than the same length of tobacco at the end of a regular brand."

Science News Letter, April 16, 1955

PHYSICS

U. S. to Build "Pool" Reactor in Geneva

See Front Cover

➤ THE UNITED STATES will build a "swimming pool" nuclear reactor at Geneva, Switzerland, for demonstration at the United Nations International Conference to be held there in August.

The research reactor will be modeled after one of the types successfully operated at the Atomic Energy Commission's Oak Ridge National Laboratory and shown on the front cover of this week's SCIENCE NEWS LETTER.

The reactor is emersed in a pool of water which affords an effective safety shield against radiation.

Qualified scientists and technicians at the August 8-20 meeting will be allowed to operate the machine, using the controls to start, maintain and stop a nuclear chain reaction within the reactor. During these experiments, known as criticality tests, the familiar blue glow of the irradiated fuel elements will be visible under the water.

The project for the Geneva Conference will be carried out by Oak Ridge National Laboratory, which is operated for the AEC by the Carbide & Carbon Chemicals Company.

The fuel will be fuel grade uranium enriched in isotope 235 to about 20%. About five kilograms of U-235 will be required.

The reactor will be tested at Oak Ridge and then dismantled and shipped to Geneva. The reactor and its fuel would be at all times under the control and custody of the AEC.

It will be housed in a temporary prefabricated metal building designed especially to enable the delegates and visitors at Geneva to see the reactor in operation.

The "swimming pool" feature will be a tank 10 feet in diameter and 20 feet deep, in which the entire reactor is immersed. Specially purified water is used for the shielding. Health and safety control will be built into the reactor.

Science News Letter, April 16, 1955

PHYSIOLOGY

X-Rays Show How Gland Affects Bone Growth

➤ THE PART played by the pituitary gland, tiny gland at the base of the brain, in normal growth, particularly of the skull and face, was demonstrated by a series of X-rays of pug-faced young rats.

The rats were photographed repeatedly over a period of eight months starting when they were 28 days old. The study was made by Drs. Henry R. Frank and C. Willet Asling, anthropologists of the University of California School of Medicine, and reported to the meeting of the American Association of Physical Anthropologists in Philadelphia.

On the first day of the experiment, the pituitary gland was removed from 16 of the 30 rats.

By that time, the width of the skull had already reached adult size. Skulls of the operated rats did not change in proportion of width to length, since loss of the pituitary cut short the length-wise growth of the skull.

The rats that kept their pituitaries, however, continued to grow in skull length, causing a drop in width-length proportion from an initial 81 to below 70.

In the normal rats, the facial part of the skull grew faster than the rest. Initially shorter, it became equal in length by the 55th day of age and after that was longer than the rest. In the rats that lost the pituitary, the facial part of the skull remained shorter than the rest.

Such repeated X-rays, the anthropologists explained, can be used to show the effects of administration of pituitary extracts on growth.

Science News Letter, April 16, 1955

MEDICINE

Clinics for Childless Have 23.2% Success

➤ A 23.2% success has been achieved by clinics helping childless couples have wanted children. Of 13,051 such couples studied and treated in 21 clinics during a period of 28 years, 3,026 pregnancies occurred.

The results were reported by Dr. Mary Steichen Calderone, medical director of the Planned Parenthood Federation of America, New York, at the meeting of the American Academy of General Practice in New York.

These clinics also make infertility studies of parents who want to adopt a child. Such studies, Dr. Calderone said, are now required by most adoption agencies.

Science News Letter, April 16, 1955

ASTRONOMY

Planet Pluto Believed Smaller Than Estimated

➤ PLUTO, MOST distant of the planets of the solar system, may be smaller than estimated, Prof. Dirk Brouwer, director of the Yale Observatory, declared in delivering the Royal Astronomical Society's George Darwin lecture and receiving the society's gold medal in London.

Electronic "brain" calculations of the orbits of Jupiter, Saturn, Uranus, Neptune and Pluto around the sun were made, and gravitational attractions of Pluto on Uranus and Neptune indicate that Pluto's mass is about that of Venus, about eight-tenths that of earth. However, a much smaller mass is suggested by direct observations through the Palomar 200-inch telescope.

"The development of high-speed calculators in recent years," Prof. Brouwer pointed out, "has opened up possibilities for the study of problems in celestial mechanics that were beyond the dreams of our predecessors of even one generation ago."

Science News Letter, April 16, 1955

IN SCIEN

PUBLIC SAFETY

Academy Begins Study On Radiation Danger

➤ THE DANGER of atomic radiation to life upon the earth, including people, will be determined by an inquiry the National Academy of Sciences will make with Rockefeller Foundation financial support.

Wide scientific differences exist as to the dangers of H and A-bomb radiation, debris from atomic power reactors and other radiation hazards of the atomic age.

Atomic tests have been criticized from both within and without the United States as a menace to populations now living and a future danger through effects on germ plasm upon generations yet unborn.

The Atomic Energy Commission, which pledges cooperation in the inquiry, has spent $165,000,000 in the past five years on the radiation problem. The cost of the NAS inquiry is not announced.

Information now kept under secrecy wraps, such as the amount of atomic contamination of the atmosphere, will be made available to the scientific committee when appointed.

Science News Letter, April 16, 1955

AERONAUTICS

No Time to See At Supersonic Speeds

➤ THINGS THAT may affect a pilot's ability to see range from common hay fever to supersonic speeds, Dr. Louis R. Raymond of East Orange, N. J., told the Aero Medical Association meeting in Washington.

Supersonic speeds, he said, cause a build-up of compression waves in the air. The optical density is thus increased to give a new refraction to light. This results in displacement of objects.

Flying at supersonic speeds gives another hazard. Normal reaction time and time required for visual perception by an alert person is considered to be one second. Flying 900 miles per hour, a plane travels 1,841 feet in a second. There may be another plane traveling at the same speed in the opposite direction. The pilot not only needs time to see the plane but time to make a decision and more time to change control of his plane.

"It is apparent," Dr. Raymond said, "that before a pilot can recognize the object it is in his cockpit, by the time he can do anything about it, the plane is a mile or more past him.

"How inadequate," Dr. Raymond concluded, "is human vision at the speed of rockets estimated at 25,000 miles per hour, or seven miles per second."

Science News Letter, April 16, 1955

CE FIELDS

PHYSICS

Discover Beryllium Made by Cosmic Rays

➤ DISCOVERY OF another radioactive substance created in the upper air by action of cosmic rays gives science a new tool for studying what happens in the atmosphere.

Beryllium 7 is born of the star-like bursts of high energy radiation from outer space smashing into and transmuting atoms of nitrogen and oxygen at about nine miles above the earth.

This was reported by Dr. James R. Arnold and H. Ali Al-Salih of the University of Chicago's Institute of Nuclear Studies in *Science* (April 1).

Two other isotopes induced by cosmic rays had already been discovered, carbon 14 and tritium, or triple weight hydrogen, and Dr. W. F. Libby, now an Atomic Energy Commissioner, has used them for radioactive dating.

The radioactive beryllium has a half-life (time radioactivity reduces to half) of only 53 days compared with radioactive carbon's 5,600 years and tritium's 12.4 years.

Measurements of beryllium in rain water show that it takes about 80 days for the radioactive material in the form of dust to descend to the level of the clouds.

There is one other sort of beryllium, isotope 10, with a half life of 2,500,000 years, that it is expected will be found to be cosmic-ray produced.

Science News Letter, April 16, 1955

MEDICINE

Urges Doctors Be More Sherlock Holmes-Minded

➤ DOCTORS SHOULD be more Sherlock-Holmes-minded, prepared at least to take a more active part in the medical aspects of unexplained deaths, a meeting of the American Academy of General Practice in Los Angeles was told.

The advice came from Dr. Charles P. Larson of the University of Washington, Seattle, who was pathologist in charge of the War Crimes Investigation for southern Germany in 1944-45.

"Who is better qualified than the physician to decide whether or not an unexplained death needs further investigation?" Dr. Larson asked. "If all coroners were physicians and had ready access to specialists in forensic pathology and allied police science, we would have an excellent medicolegal system."

He explained forensic pathology as that branch of medicine which involves the examination of tissue and other body substances in an effort to answer legal questions.

"The pathologists can and will assume their part in this investigative obligation and I'm sure that practicing physicians will do likewise."

Dr. Larson made the following suggestions to the Academy: "1. That this great body of medical practitioners become intelligently aware of the deficits in our present state laws which preclude the establishment of an adequate medicolegal investigative system and that you aid in their correction, and 2. That every doctor should assume his obligation to his community to improve every phase of the practice of medicine."

Science News Letter, April 16, 1955

MEDICINE

Blue Dye, Radioactive Vitamin Test Stomach

➤ A BLUE dye and a radioactive vitamin are among new weapons being tried in the fight on stomach cancer. Both are being used in efforts at early detection of this killer.

The blue dye, azure A, is incorporated in a cation exchange resin. It is used to tell whether or not there is a normal amount of acid in the stomach. Too little acid or none at all may be a sign of stomach cancer.

The new exchange resin dye test will be welcomed by patients. With it they do not have to swallow a stomach tube through which stomach juices would be collected for acidity tests. Instead, they swallow the resin and dye in a big glass of water. A couple of hours later a sample of urine is examined. A simple color change in it allows estimation of presence, absence or borderline secretion of acid by the stomach. Depending on the results, the patient may be given further tests for diagnosis.

The new cation exchange resin with the dye was reported by Dr. Harry L. Segal of the University of Rochester School of Medicine, Rochester, N. Y., at the Sixth National Gastrointestinal Cancer Conference held in New York under the sponsorship of the National Advisory Cancer Council of the National Cancer Institute.

Previously, a similar test had been developed using a quinine ion exchange resin.

Vitamin B-12 made radioactive by cobalt 60 is being used by Dr. Lloyd D. MacLean of the University of Minnesota Medical School, Minneapolis, in somewhat the same way to test for presence or absence of acidity in the stomach. Pernicious anemia patients do not have normal acid in their stomach and in addition they do not produce a substance, called "intrinsic factor," needed to absorb Vitamin B-12.

When normal persons are given the radioactive vitamin, it can be found in their urine, but this is not the case with pernicious anemia patients. Dr. MacLean thinks this test may show whether persons lacking stomach acid have pernicious anemia or some other condition, such perhaps, as stomach cancer.

Science News Letter, April 16, 1955

PHYSIOLOGY

Brain May Be Stimulated Without Causing Damage

➤ USING AN electric current to stimulate human brains in diagnosis and treatment might be done safely, it appears from studies at the National Institutes of Health, Bethesda, Md.

Whether the method would be effective on humans is not yet known. The tests so far, on monkeys and other laboratory animals only, indicate that the method would not cause brain damage if a bi-directional pulse were used.

At present, neurosurgeons and psychiatrists use a unidirectional or rectangular pulse to stimulate the brain. There is evidence to show that unidirectional pulses damage the brain. The tests, however, showed that the use of a bi-directional or "back and forth" pulse used for long-term stimulation did not cause damage to the brains of two monkeys.

Flashing electric lights attached to an array of electrodes deep in the monkey's brain show what part of the inner brain controls what activity of the monkey. From these stimulations, scientists are able to map the brain showing which areas control actions, thoughts and feelings.

Electric waveforms are used to stimulate and record the electrical activity on the surface of the conscious brain, as well as the inner brain. It is also an aid in diagnosing and treating mental illnesses, but is not electric shock therapy.

The results of the experiments and a description of the new noninjurious method of electric stimulation were reported to the scientific journal *Science* (April 1) by Drs. John C. Lilly, John R. Hughes, Ellsworth C. Alvord Jr., and Thelma W. Galkin.

Science News Letter, April 16, 1955

PSYCHOLOGY

Child Who Seems Deaf May Not Want to Hear

➤ A CHILD may seem deaf because he is so emotionally disturbed that he does not want to hear, Drs. A. Bruce Graham and J. Lewis Hill of the Henry Ford Hospital, Detroit, reported at the meeting of the American Academy of General Practice at Los Angeles.

A mentally retarded child may also seem deaf because sounds and speech do not interest him nor attract his attention.

A third cause for seeming deafness in a child is disturbance in perception which make sounds and speech confusing. This may afflict aphasic children in the brain-injured group.

The Detroit doctors warned parents and general practitioners that the cause of deafness, and whether it is true or apparent, should be determined in order to give the child suitable treatment and training as early as possible.

Science News Letter, April 16, 1955

PUBLIC SAFETY

Backyard Front Lines

The once peaceful and secure gardens of American homes may be the first line of defense against H-Bomb attack. Shelters, evacuation and B-rations can spell survival.

By HOWARD SIMONS

➤ TERRIFYING WEAPONS have moved the fox-hole, bunker and emergency ration from the infantryman's front-line to everybody's backyard. "Dig or die," and "duck and cover," apply not only to G. I.'s some 10,000 miles away, but are realities for the politician, the housewife, the worker and the schoolboy.

The folks at home must learn the simple art of staying alive during an atomic, hydrogen, biological and/or chemical attack.

At least one out of eight Americans already know how.

They are the nation's hard core of professional survivors. They include war veterans, cyclone-harried farmers, volunteer firemen, and flood and earthquake battlers. Each has had some experience with the basic civil defense measures that can mean life or death.

There are more than 21,000,000 wartime veterans alone in the United States. A veteran heads almost one of every two families in the nation.

Fox-Hole Shelter

Combining what was known in the Army as "field expediency" (more popularly, "American Ingenuity"), with the nation-wide hobby, "do-it-yourself," and these past masters at survival can convert the government issue fox-hole, bunker and emergency ration into effective protection for themselves and their families.

In recent weeks, a good deal of non-lethal dust has been kicked up by the H-bomb word blast set off when the Atomic Energy Commission released information about the bomb's destructive power and its deadly effects.

But in spite of seeming confusion, the announcement did not negate previous civil defense measures for saving one's life.

"The H-bomb is bigger than the A-bomb," states the Federal Civil Defense Administration, "but it is still a bomb. It has its limits, as does any other weapon. It makes the civil defense problem larger, but not different."

Based upon what was learned at the H-bomb tests conducted in the Pacific, the FCDA has defined four general rings of destruction depending on the size of the bombs, and the best means of staying alive if you live or work in the given area. They are:

1. A central area surrounding ground zero in which there is total destruction of life and property. Escape from the area is the only answer.

2. A larger ring in which danger and destruction would be "heavy" to "medium." Here again, dispersal is the best defense, although a shelter deep enough and solid enough can save your life.

3. Another large ring in which the damage is light. A home shelter will protect you both from the blast and radioactive fallout.

4. The surrounding area exposed to lethal fallout, in which a covered shelter will save your life.

"The best means of protection from the immediate effects of atomic or hydrogen bombs," the FCDA reports, "are distance from the center of explosion and the protection of suitable shelter."

Spelled out, a hop, a skip, and a jump into a prepared shelter can save your life.

Five types of shelters for home occupants and home builders have been designed by civil defense experts. Offering varying degrees of protection according to corresponding costs and materials used, they include the reinforced-concrete lean-to, the wooden lean-to, the basement corner room, the high covered trench with concrete roof and the reinforced-concrete basement exit.

The first three are relatively easy and cheap to build, ranging in cost from $40 to $95, and similarly offer less protection. They are classed as indoor shelters.

The covered trench with concrete roof and the reinforced-concrete basement exit, both outdoors shelters and bunker-like, offer the best protection from both blast, debris and radioactive fallout.

Costing about $180 to build and designed for six persons, the covered trench shelter "consists of a rectangular box, the roof of which is precast or poured concrete or wood supported on block walls and covered with three feet of earth."

The entrance is placed at right angles to the length of the shelter to prevent debris from entering the shelter and to protect

SHELTERLESS DEATH—Your family could very well be this unprepared mannequin family caught by an atomic blast 3,500 feet from ground zero at Yucca Flat, Nevada. By contrast, mannequins in the basement shelters of this house were undamaged. You, too, can live by applying basic civil defense measures which a great majority of Americans already have experienced and know.

further the occupants from heat and gamma radiation. It is also recommended that, like a wartime bunker, the shelter be sunk well into the earth.

The basement exit shelter costs about $1,000, if built for you, and "is actually a low tunnel, three feet wide, with an entrance at one wall near the corner of the basement, and extending 10 feet to steps or a ramp to the surface."

FCDA states that considerable work is involved in constructing this type shelter and the householder who attempts it should find help.

Because of what has been learned of the lethal fallout, it is suggested that surface doors and air intakes be added to all shelters.

The two outdoor shelters "will provide protection against blast hazards," in the three rings of destruction, surrounding the immediate blast area at ground zero.

For those living in areas not directly affected by the blast, heat and radiation, but in danger from radioactive fallout, cheaper types of cover will provide protection. These can be vegetable cellars or cyclone cellars with a three-foot earth cover.

Fox-holes or open trenching with an overcoat thrown across the top, can also save lives, although they give less substantial protection. They are particularly useful if caught on the open highway during an attack.

Anyone who has experienced disaster knows the value of having emergency stores of food and water. With little expense and effort, home-made rations can and should be set aside now.

Water Contamination

Drinking water can be made unsafe during an attack by radioactive contamination, being poisoned with chemicals, through leaking sewage or by becoming diseased during a bacteriological attack.

Enough drinking water should be stored in a shelter or carried in a car to provide one gallon for each person. Where there are children under three years of age in the household, FCDA recommends an extra gallon for each, for a three-day supply. Milk, soft drinks, fruit juices and water or liquids from canned fruits and vegetables may be substituted.

Storing home-made B-rations (Bomb rations) can be achieved by providing a balanced three-day supply including canned fruits and juices, vegetables, soups, milk, tea bags and instantaneous drinks, canned meat and fish, baby foods, raisins and chocolate, packaged cereals and dried foods.

For babies, disposable diapers, powdered mixture for the formula, and canned or powdered milk and easily digestible foods, must be stored too.

A great number of the population is experienced in building shelters without realizing it; so, too, a number of the population is well versed in preparation for disaster and in evacuation techniques.

To cite a few examples, when civil defense officials are queried as to what cities are best prepared today, they include in the list, Worcester, Mass., and add that civil defense-mindedness in that city came about after Worcester had suffered through a tornado in 1952.

Officials also point out that residents of coastal towns and cities in hurricane areas are evacuation-sensitive. By the same token, persons living in constant danger of floods have been sent packing and moving at a moment's notice years before the coming of atomic weapons.

Unfortunately, escape from death and disaster and knowledge of those life-saving measures necessary to survival in the past does not necessarily mean escape from death and disaster in the future. Organization and an active part in civil defense has become a must for the veteran as well as the uninitiated.

Organized civil defense has been called both a shield and a sword and as stated by those responsible for its functioning, "there will always be much more of America undamaged, and many more millions of our people eager to fight back and win, than there will be death and destruction," if an H-bomb attack is made on the United States.

Science News Letter, April 16, 1955

CHEMISTRY

Plastic Chemicals Improve Soil for Roads

➤ SOIL UNDER road surfaces and behind walls can be made stronger and less waterlogged, the American Chemical Society meeting in Cincinnati was told.

Chemicals can alter soil properties. To the familiar types of cement and asphalt paving materials, chemists have added new kinds of plastic materials to improve soils from the engineer's point of view.

Acrylic polymers and their calcium compounds were discussed by Dr. Vincent C. Meunier of Rohm and Haas Chemical Company and Dr. James H. Reynolds Jr., formerly with the U. S. Corps of Engineers. Both noted limitations in these materials as used at the present time but recommended further study of these materials for improved rapid soil solidification.

Improved methods are available for mixing chemicals with soil. Dr. Alan S. Michaels and Dr. T. William Lambe of the Massachusetts Institute of Technology pointed out the difficulty of getting civil engineers to use the new soil treatments.

Science News Letter, April 16, 1955

ASTRONOMY

Galaxy's Arms Spiral In

➤ FIRST DIRECT evidence that the Milky Way galaxy, a giant celestial pinwheel in which the sun is one of billions of stars, has arms spiraling toward the center was reported to the American Astronomical Society meeting in Princeton, N. J.

Dr. Edward F. McClain of the Naval Research Laboratory, Washington, told how he had used radio waves to look deep into the heart of our galaxy. The radio messages received from the center and beyond it indicate the inward spiral winding.

The NRL observations at 1420 megacycles confirm three different mathematical attempts, also reported at the meeting, to show that the Milky Way has the same spiral structure as other "island universes."

Dr. Frank K. Edmondson of Indiana University assumed that movements of hydrogen in the galactic arms, detected by radio radiation, are not at right angles to the radius, but at a slight angle. His calculations then show the spiral motion and eliminate a "kink" previously seen in the spiral arm just beyond that in which the sun is located.

Dr. Harold Weaver of the University of California attacked the problem of galactic motion starting with basic equations. He found that there is a change in the rotational velocity with greater distance from the galactic center, and that this change is smooth rather than reaching a peak in the spiral arm next closest to the center from the sun.

Mrs. Vera Rubin of Georgetown College Observatory, Washington, also calculated the form of the galactic arms. She modifies by a variable angle the original circular motion proposed by the Dutch astronomers, Drs. Jan H. Oort, H. C. van de Hulst and C. A. Muller of Leiden Observatory, the Netherlands.

Dr. McClain found that there is a relative velocity of approach between the hydrogen sending out radio waves on the far side of the galaxy and the sun, and that "a departure from circular motion is present in the galaxy."

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MEDICINE

Movies Detect Cancer

Equipment used by amateurs to take pictures of family can allow doctors to study tissues at length without prolonged exposure of patient to X-rays.

➤ MOVING PICTURE equipment used by amateurs to take pictures of the family is now helping detect cancer of the digestive system, leading cause of cancer deaths in the United States.

The method and its advantages were reported by Dr. W. Edward Chamberlain of Temple University School of Medicine, Philadelphia, at the Sixth National Gastrointestinal Cancer Conference held in New York under the auspices of the National Advisory Cancer Council of the National Cancer Institute.

One important tool doctors have been using to detect cancers of the digestive tract has been the fluoroscope. In the early days the image seen this way was not too clear. Recently, Dr. Chamberlain explained, the physical principles of radio and television amplifiers, electron microscopes and World War II "sniperscopes" have been combined in a device that amplifies the brightness of the fluoroscopic image as high as a thousandfold.

This means much less intense X-rays need be used to produce the image, which saves patient and doctor from some undue exposure to the radiation. What is to be seen can be seen quickly without the uncertainty that formerly prolonged the time of exposure to the X-rays.

Now, Dr. Chamberlain finds, these bright images can be recorded on ordinary motion picture film with ordinary amateur movie equipment. The film can then be studied at length with no further exposure of patient or doctor to X-rays.

A further advantage is that this equipment is relatively inexpensive and therefore can be used many places where it has not been available before because of cost.

Stomach cancer detection in the future may be aided by electrical records traced on paper and called Electrogastrograms. While still in the experimental stage, these may prove as useful in the future as the electrocardiograms are now in diagnosing heart conditions.

The Electrogastrogram gives a synchronized recording of the electrical and mechanical activity of the stomach. One electrode is swallowed in a tube to the stomach and the other is put on the abdomen. Two hundred consecutive cases of stomach disorders have been diagnosed electrographically without benefit of any other clinical findings, Drs. Edmund N. Goodman, Henry Colcher, George Katz, Melvin Schwartz and Miss Carolyn Dangler of Columbia University College of Physicians and Surgeons, New York, reported.

Science News Letter, April 16, 1955

GOLF

Your LEFT SHOULDER makes the amazing difference!

One of the most startling discoveries to emerge from wide research in the golf swing is that your game literally hinges on your left shoulder!

How this is so and how to use this great discovery to improve your own game beyond all expectation in a matter of short weeks is set for in THE GOLF SECRET by Dr. H. A. Murray—a medical doctor, golfer, and golf researcher, who has applied his expert knowledge of anatomy in this sweeping and utterly different study of the golf swing.

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• RADIO

Saturday, April 23, 1955, 5:00-5:15 p.m. EST

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Mrs. Nena W. Badenoch, consultant in the National Society for Crippled Children and Adults, New York, and Mr. John Knox Shear, editor-in-chief, Architectural Record, and formerly head of School of Architecture, Carnegie Institute of Technology, will discuss "The Stepless House."

ARCHAEOLOGY

Ancient Bones Can Be Tested for Syphilis

➤ A TEST used to detect syphilis in living persons can also be used on dry bones to find out whether the person, when alive, suffered from the disease.

This test may settle the old controversy over whether the white man brought the dread disease syphilis to the American Indian or whether the disease was already established in America before the coming of Columbus.

The test used is known to doctors as the "Trepanomal Pallidum Immobilization" (TPI) test. Its successful use on dead bones was reported to the meeting of the American Association of Physical Anthropologists in Philadelphia by Dr. Frederick P. Thieme of the University of Michigan.

It is not yet known, however, just how long after death the test can be used successfully.

Science News Letter, April 16, 1955

ASTRONOMY

Lightest Star Found

➤ A STELLER light-weight, the least massive and second faintest star known, has been seen with the giant 200-inch telescope atop Mt. Palomar in California.

Only one-twelfth the mass and 70,000 times fainter than the sun, it was discovered exactly where astronomers at Sproul Observatory, Swarthmore, Pa., had calculated it would be, Dr. Peter van de Kamp, director of the observatory and Miss Sara Lee Lippincott announced.

The new star, known as Ross 614-B, is the third "unseen" star ever spotted, Dr. van de Kamp told the American Astronomical Society meeting in Princeton, N. J. The other two were found in the 19th century.

Miss Lippincott, also of Sproul Observatory, plotted the wobble in the path of the visible star caused by its then unseen companion. Dr. W. Baade of Mt. Wilson and Palomar Observatories aimed the 200-inch telescope at the spot where her calculations showed it should be. The faint companion was found on photographs taken March 23, and is of absolute magnitude 17, compared to that of 15 for the primary star.

The two stars are separated by a distance four times that between the earth and the sun, or about 400,000,000 miles. They revolve around the center of the combined mass with a period of 16 and a half years.

Single stars, such as the sun, move through space in straight lines. In a double star system, however, because the two revolve around a common center, their paths when plotted separately wobble.

Only the 200-inch has enough light-gathering power to find the faint companion and, even with it, the two stars had to be at their greatest separation to be seen. Miss Lippincott predicted this would happen in 1955.

The other discoveries of unseen companions to known stars, were to Sirius, the dog-star, in 1862 and Procyon in 1896.

The only fainter star now known is called Van Biesbroeck's star after its discoverer, Dr. George Van Biesbroeck of Yerkes Observatory, Williams Bay, Wis. Although it is two magnitudes fainter than Ross 614-B, its mass is not known.

Dr. Martin Schwarzschild of Princeton Observatory said that the discovery of such a faint, light-weight star had "very important" implications in theories concerning the birth and growth of the sun and other stars.

Science News Letter, April 16, 1955

ENTOMOLOGY

NATURE RAMBLINGS

The Bumblebee's Sleep

➤ A LITTLE later in emerging from winter quarters than their smaller kindred, the bumblebees should be in evidence by now.

Why bumblebees fare forth later than their semi-domestic cousins, the honey-bees, cannot be stated definitely. It may be because the bumblebee's best food plants have not yet developed their flowers, or it may be simply because the big insect, being a ground-dweller, is not warmed up as early as the hive-inhabiting honey-bees.

The bumblebee is a semi-solitary insect to begin with. New colonies are founded by solitary females that fly away from the parent hive in autumn. The female bees then proceed to dig themselves in, though winter is still remote. They sleep in their little burrows more than half-way round the calendar. While the weather is still warm, they do not sink into the deep and death-like slumber of true hibernation from which they are now emerging. After the first frost, however, the female bumblebees remain profoundly unconscious until spring warmth arouses them.

This deep sleep of hibernation is quite probably a matter of physical economy, for the bee must depend on the food stored in her own body tissues, plus a gorged crop from a last drink at the honey pots of the home nest.

About now, the bee fares forth to find some nectar on which to feed, then proceeds to hunt a new homesite—frequently in an abandoned burrow of some other animal or a natural crack. There she digs out a chamber more commodious than her winter bedroom, and on the floor of this sets up waxen household pots, which she stocks with food.

Unlike the honey-bee queen, she is, at this stage of her existence, very much a worker; the honey-bee queen is simply a maternal mechanism, and cannot work at all—can scarcely even feed herself.

Having got the nucleus of a home started, the bumblebee queen lays her first few eggs, and when the hungry little grubs hatch from them, she becomes an even more zealous worker than before. Only when she has this first small squad of workers brought up and ready to go forth and seek the community bread and honey does she retire like a lady, and thenceforth devote herself strictly to the business of being an ancestor.

At one time it was thought that only bumblebees could pollinate red clover. Scientists have now found, however, that this is not the case. Although the honey-bee does not have the equipment to get at red clover's nectar, when gathering pollen it serves as an effective means of pollinating this crop. And a good thing, too, for the giant bumblebee grows more scarce each year.

Science News Letter, April 16, 1955

MEDICINE

Seek Cancer Blood Test

➤ DISCOVERY OF a potential basis for developing a blood test to detect early cancer was announced by Dr. Jack G. Makari of Texas Medical Center, Houston, at the meeting of the American Association of Pathologists and Bacteriologists in Houston, Tex.

Dr. Makari cautioned that the method he used is not yet a diagnostic test for cancer.

The test reaction is based on the body's ability to react to and destroy bacteria and foreign protein invaders. These foreign agents are called antigens, while the body's own destructive agents are referred to as antibodies.

Cancers produce these antigens, which provoke a reaction in the body in the form of specific reacting antibodies. A major problem in devising a suitable diagnostic test has been to separate cancer antigens from other type antigens in the body.

Dr. Makari sensitized virgin female guinea pig tissues to cancer antigens. By a special method he then desensitized the same tissues to similar but non-cancer types of antigens so that the response was only to the cancer type. Testing the sensitized tissues on human blood plasma, he found that the plasma of cancer patients produced a positive reaction.

Like many biological tests, Dr. Makari pointed out, this has a number of pitfalls which should be carefully avoided to obtain the best results. Under the best conditions yet found, where the serum or plasma is used fresh or platelet free and where the sensitizing antigen is of small particle size, this test has given a high degree of specificity and sensitivity. It is positive in 96.8% of proven, untreated carcinoma cases and 4.8% of patients with other diseases, and in 5% of presumed normals.

Science News Letter, April 16, 1955

Deer *antlers* are made of solid bone and are shed annually.

PSYCHOLOGY

Children, Like Papa, Want Their Dividends

➤ CHILDREN, LIKE their elders, want dividends. And while Papa may watch the stock market to see where his are coming from, the children will watch his moods to see how to get theirs.

Failure to understand that children work on a dividend basis, though with less plan and finesse than grown-ups, may cause a lot of emotional turmoil in the home and lead to maladjustment in a child, Dr. John G. Young, pediatrician of Dallas, Tex., told members of the American Academy of General Practice in Los Angeles.

The day wears on mother and children and by 5 p.m. the "American home goes to pot," Dr. Young also said.

Temper tantrums, he said, are "dividend getters." The dividend is attention from mother, nurse or father or all three. Recognizing this and failing to give the dividend usually stops the tantrum.

Healthy babies, even as young as four weeks, may cry for the dividend. If they get it repeatedly, they may go on crying. The child is then called "spoiled." But, said Dr. Young, he is "a well educated individual using the means at his command to get his dividend."

Science News Letter, April 16, 1955

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

ANTIBIOTICS AND ANTIBIOTIC THERAPY: A Clinical Manual—Allen E. Hussar and Howard L. Holley—*Macmillan*, 475 p., $6.00. A systematic review of antibiotics written to serve as a practical clinical guide for the proper use of antibiotic agents.

ASSURING THE COMPANY'S FUTURE TODAY: Corporate Management in a Dynamic Economy—M. R. Sullivan and others—*American Management Association*, General Management Series No. 175, 72 p., paper, $1.75. Examining various aspects of company survival and growth in an expanding economy.

ATOMS TODAY & TOMORROW—Margaret O. Hyde—*Whittlesey House*, 143 p., illus., $2.50. In simple language the author demonstrates what atomic energy is, how it is being used today and what we can expect in the near future.

CHICKENS AND HOW TO RAISE THEM—Louis Darling—*Morrow*, 63 p., illus., $2.00. To introduce children to an interesting and profit-making hobby.

CLASS AND SOCIETY—Kurt B. Mayer—*Doubleday*, 88 p., paper, 95 cents. The author views class as a multidimensional component of the social order.

DIAGNOSES OF CHILDREN SERVED IN THE CRIPPLED CHILDREN'S PROGRAM 1952—Sadie Saffian and Margaret F. McKiever—*U. S. Dept. of Health, Education, and Welfare*, Children's Bureau Statistical Series No. 25, 30 p., illus., paper, free upon request to publisher, Washington 25, D. C. More than 238,000 children were served by state crippled children's programs in 1952.

DYNAMICAL THEORY OF CRYSTAL LATTICES—Max Born and Kun Huang—*Oxford University Press*, 420 p., illus., $8.00. In the preface Nobelist Max Born states that he started "from the most general principles of quantum theory" and derived "the structures and properties of crystals" and that Huang's main contribution was the "extension of the theory of elasticity of lattices to finite strains."

EDUCATIONAL LEAVE IN THE PUBLIC CHILD WELFARE PROGRAM 1953—Children's Bureau—*U. S. Dept. of Health, Education and Welfare*, Children's Bureau Statistical Series No. 26, 9 p., paper, free upon request to publisher, Washington 25, D. C. This report shows that more than nine out of every 10 persons on leave came back to work with the agency which had granted the leave.

ELECTROLYTE SOLUTIONS: The Measurement and Interpretation of Conductance, Chemical Potential and Diffusion in Solutions of Simple Electrolytes—R. A. Robinson and R. H. Stokes—*Academic*, 512 p., illus., $9.50. For the practical electrochemist.

ELECTROLYTIC REGENERATION OF SPENT PICKLING SOLUTIONS—Henry C. Bramer and James Coull—*Mellon Institute*, 4 p., illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. A proposed process for the electrolytic regeneration of spent sulfate pickling solutions.

FAMOUS INVENTORS AND THEIR INVENTIONS—Fletcher Pratt—*Random House*, 142 p., illus., $2.75. Telling for young people the story behind many famous inventions.

FAMOUS SCIENTIFIC EXPEDITIONS — Raymond Holden—*Random House*, 144 p., illus., $2.75. Stories of scientific adventure for young people.

GEOGRAPHY OF THE NORTHLANDS—George H. T. Kimble and Dorothy Good, Eds.—*American Geographical Society* and *Wiley*, 534 p., illus., $10.50. With the growing importance of the Arctic in the present world, geographical knowledge becomes vital. This book provides a detailed review of current knowledge and points out the nature of relationships between man and the lands and resources of high latitudes.

A HISTORY OF DERMATOLOGY IN PHILADELPHIA: Including a Biography of Louis A. Duhring, M.D., Father of Dermatology in Philadelphia—Reuben Friedman— *Froben Press*, 556 p., illus., $10.00. Philadelphia has played an important role in the history of dermatology in America.

HUMBOLDT: The Life and Times of Alexander Von Humboldt 1769-1859—Helmut de Terra—*Knopf*, 386 p., illus., $5.75. The biography of a scientist of an earlier day by a leading anthropologist of today.

INSANITY, ART, AND CULTURE—Francis Reitman—*Philosophical Library*, 111 p., illus., $3.75. Dealing with the diagnostic value of artistic creations of the mentally ill.

THE LIFE OF BACTERIA: Their Growth, Metabolism, and Relationships—Kenneth V. Thimann — *Macmillan*, 775 p., illus., $13.50. Written as a text for an advanced course and assuming previous knowledge of organic chemistry.

MAKING THE MOST OF MARRIAGE—Paul H. Landis—*Appleton-Century-Crofts*, 542 p., illus., $5.50. Viewing marriage as a multitude of situations and relationships requiring more or less continuous adjustment.

THE MARGARET SANGER STORY: And the Fight for Birth Control—Lawrence Lader—*Doubleday*, 352 p., illus., $4.00. Telling of a woman's crusade for planned parenthood and the prevention of unwanted conception.

MEN AND PLANES: Volume Six of The Army Air Forces in World War II—Wesley Frank Craven and James Lea Cate, Eds.—*University of Chicago Press*, 808 p., illus., $8.50. This volume deals, not with combat activities, but with the development of an effective air organization, the creating of weapons and the training of men.

MODERN MEDICINE ANNUAL 1955—Walter C. Alvarez, Ed.—*Modern Medicine*, 1636 p., illus., $7.50. Articles that appeared in Modern Medicine during 1954.

NEUROLOGY—S. A. Kinnier Wilson, edited by A. Ninian Bruce—*Williams and Wilkins*, 2nd ed., 3 vols., 2060 p., illus., $37.50. Improved methods of diagnosis and the recognition of conditions previously confused with serious neurological diseases made complete revision necessary.

ONE MAN IN HIS TIME—N. M. Borodin—*Macmillan*, 344 p., $4.50. The autobiography of a Russian microbiologist who in 1948 renounced his Soviet citizenship. It was written to let people know what life is like in Russia.

PAINTING RAILROAD BRIDGES—Joseph Bigos—*Mellon Institute*, 21 p., illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Some of the techniques used in painting bridges and some developments in paint testing.

THE PSYCHOLOGY OF THOUGHT AND JUDGMENT—Donald M. Johnson—*Harper*, 515 p., illus., $6.00. An attempt to systematize an ill-defined area of psychology.

SOCIAL ANTHROPOLOGY OF NORTH AMERICAN TRIBES—Fred Eggan, Ed.—*University of Chicago Press*, 2nd ed., 574 p., $7.00. Enlarging on the first edition published in 1937.

SOFT-BILLED BIRDS—Carl Naether—*All-Pets*, 64 p., illus., $3.50. Giving practical information for persons who wish to house, feed or even breed birds that eat insects.

SOLUBILIZATION: And Related Phenomena—Mary Evelyn Laing McBain and Eric Hutchinson—*Academic*, 259 p., illus., $7.00. Dealing with the fundamental principles of solubilization.

SURVEY REPORT OF ORGANIZATIONS AIDING INVENTORS—James J. Bartlett—*B & B Research Publications*, 7 p., paper, $1.00. Directory of 54 organizations functioning in the field of invention development and commercialization, compiled from a comprehensive research survey of the United States and Canada.

SYMPOSIUM ON NUTRITIONAL ASPECTS OF BLOOD FORMATION: Proceedings of the Nutrition Symposium held at the University of Cincinnati, College of Medicine, Cincinnati, Ohio, Oct. 22, 1954—G. E. Cartwright and others—*National Vitamin Foundation*, 74 p., illus., paper, $2.50.

TEXTBOOK OF THE RHEUMATIC DISEASES — W. S. C. Copeman, Ed.—*Livingstone (Williams and Wilkins)*, 2nd ed., 754 p., illus., $11.00. Discovery of the action of Cortisone, Hydrocortisone and ACTH on certain forms of rheumatic diseases has made necessary the rewriting of much of this volume.

THEORY OF CORROSION AND PREVENTION OF PAINT FAILURES—Joseph Digos—*Mellon Institute*, 19 p., illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Discussing the theory of corrosion of structural steel, the action of paint in preventing corrosion, and the causes and prevention of paint failures.

TRANSFORM CALCULUS: With an Introduction to Complex Variables—E. J. Scott—*Harper*, 330 p., illus., $7.50. Intended mainly for engineers and those interested in the application of mathematics, this test emphasizes the solution of physical problems.

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MEDICINE

Predict 235,000 Cancer Deaths in U. S. in 1955

➤ CANCER WILL kill about 235,000 men, women and children in the United States this year, statisticians at the National Cancer Institute, Bethesda, Md., estimate.

In a report prepared at the request of SCIENCE SERVICE, the government cancer statisticians said there will be 263,500 new cases of cancer discovered in men and boys in the United States during 1955, with 120,000 deaths.

In women and girls, 286,500 new cancer cases are expected with 115,000 deaths.

Cancer of the digestive system will account for about 45% of the cancer deaths in males and about 35% of the cancer deaths in females this year. The digestive system, in these figures, includes esophagus, or gullet, stomach, intestines and colon.

These figures show cancer of the digestive system to be the leading cause of cancer deaths. The government statisticians expect 87,500 new cases of cancer of this system to be discovered in males in 1955, with 54,000 deaths, and 70,000 new cases in females with 41,000 deaths.

Science News Letter, April 16, 1955

PSYCHOLOGY

"What People Think" Leads to Lock-Step Life

➤ A "WHAT will people think" disease is driving us all, cab driver as well as scientist, toward straitjacketed thinking and lock-step living, Dr. F. H. Sanford, executive secretary of the American Psychological Association, told a workshop on anti-intellectualism of the American Civil Liberties Union meeting in Washington.

Scientists in a democratic society have a special responsibility to combat this pressure toward conformity and to do what they can to tell people about their work, Dr. Sanford said. Psychologists have a special need to avoid the hoarding of knowledge and the cultivation of mystery.

"They must do what they can," he said, "to insure that knowledge of people is also knowledge for people."

The national security problem is complicated by the fact that no precise methods are known for determining who is, and who is not, a "security risk."

Since such scientific methods are not available, security procedures are "influenced by politics, by the climate of opinion, and by any hysterical wind that blows."

The climate of opinion "clearly has an anti-intellectual flavor that influences not only the workings of the security system but also the workings of individual American minds," Dr. Sanford said.

Science News Letter, April 16, 1955

Questions

ANTHROPOLOGY—What is osteoporosis? p. 245.

□ □ □

CHEMISTRY—How does the new process of making gasoline use urea? p. 246.

□ □ □

MEDICINE—How do king size cigarettes effect the amount of nicotine and tars inhaled? p. 247.

□ □ □

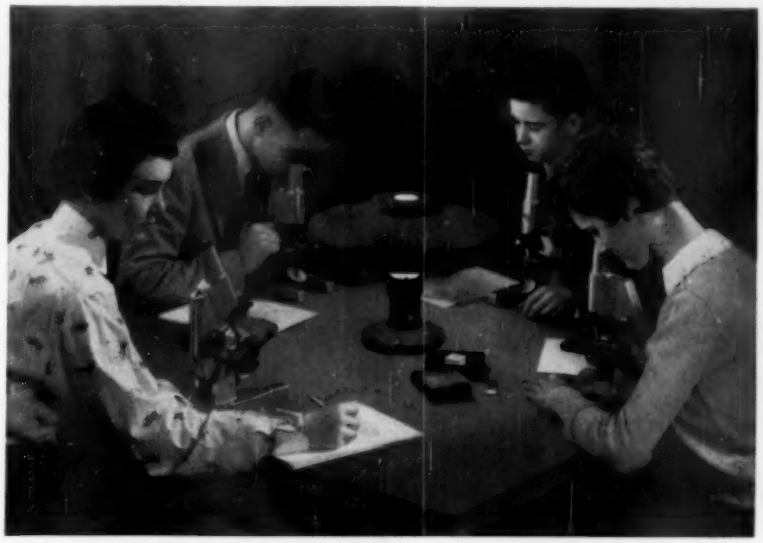
RADIO ASTRONOMY—What is believed to be the cause of the radio waves from Jupiter? p. 243.

□ □ □

TECHNOLOGY—How high are the temperatures and pressures needed to make a garnet? p. 243.

□ □ □

Photographs: Cover, Union Carbide and Carbon Corporation; p. 243, General Electric; p. 245, Gaynor and Co., Inc.; p. 247, New York University; p. 250, Atomic Energy Commission; p. 256, Willard Stewart, Inc.



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Science News Letter, April 16, 1955

AUXILIARY ACCELERATOR is designed for driving automatic-shift cars by feeding gas with the left foot, leaving the right foot free for brake action. Made of steel and rubber, the left-foot substitute has a bar that controls the actual accelerator on the right driving side of the floor board.

Science News Letter, April 16, 1955

HERBICIDE APPLICATOR for the home gardener is an areosol weed killer attached to a walking stick, thus eliminating bending. Spray can be concentrated on a small spot to kill weeds growing next to desired plants. One 12-ounce container on the 28-inch, ball-handle stick treats 600 weeds.

Science News Letter, April 16, 1955

NIGHT PIERCER is an infra-red instrument that enables the human eye to see great distances in darkness and dense fog. Seen as a safety device for transportation vehicles, the combined infra-red receiving tube and built-in coated lens, was recently taken from under Navy security wraps.

Science News Letter, April 16, 1955

TOY BIRD that looks like a paper airplane flys by flapping its wings. The 15-inch tear-proof wings and tail are coated with a tough, polyester film. The toy bird, shown in the photograph, is powered by several rubber bands inside the plastic fuselage which in turn cause the wings to flap. Available soon will be wing-flapping butterflies, bats, bees and moths.

Science News Letter, April 16, 1955

NIGHT TIMEPIECE glows in the dark by means of "indirect lighting." Eliminating need for excessive luminous paint, the substance used is claimed to be three times brighter than that used in "radium watches." The location of hour and minute pointers show up in relation to the hour markers.

Science News Letter, April 16, 1955

SHEET MATERIAL for laboratory table tops and similar uses resists heat, impact and most active chemicals. Basically a mixture of Portland cement and asbestos fibers, the new material is available in charcoal gray and cameo brown. Metal working tools are all that is needed to drill, rout or mill the sheets.

Science News Letter, April 16, 1955

CELLULAR GLASS insulating material combines insulation with a ceramic finish, making a finish coating unnecessary. A completely insulated wall can be erected in one operation. Made of pure glass, the material is chemically resistant and does not provide food or nesting for rats.

Science News Letter, April 16, 1955

Do You Know?

Yoghurt is made by converting the sugar in milk to lactic acid.

Hay fever can be contracted at any age but it usually begins before the age of 40.

This summer, 86,000 square miles of the *Arctic* and sub-Arctic will be topographically surveyed by the Army.

A bamboo pole hanging from a weaving helicopter has been used to knock ice from *power lines.*

A device has been developed for private planes that can automatically prevent them from going into a *spiral dive.*

One of the most biologically important radioactive substances found in *fall-out* of atomic bombs is strontium 90, which has a relatively long persistence.

The smallest of all armadilios, the *pichiciego,* has a vertical shield at the rear of its body that closes the path behind as it digs its tunnel.

A *cosmic ray detector* is being used in Australia for the first time to determine the density of the land mass above a tunnel now being constructed.

Science News Letter, April 16, 1955

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